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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/051,890 | 01/16/2002 | Michael Connell | 108298638US | 7922 |

25096 7590 10/08/2003

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EXAMINER

OSELE, MARK A

ART UNIT

PAPER NUMBER

1734

DATE MAILED: 10/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application N .

10/051,890

Examiner

Mark A Osele

Applicant(s)

CONNELL ET AL.

Art Unit

1734

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-49 is/are pending in the application.
- 4a) Of the above claim(s) 1-10 and 27-49 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 11, 13-19, 23, 25 and 26 is/are rejected.
- 7) ☒ Claim(s) 12, 20-22 and 24 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 1-16-02 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-10, drawn to a method of dicing a semiconductor wafer, classified in class 156, subclass 247.
 - II. Claims 11-26, drawn to a method of dicing wafers and bonding the components, classified in class 156, subclass 299.
 - III. Claims 27-38, drawn to a microelectronic assembly, classified in class 430, subclass 9.
 - IV. Claims 39-49, drawn to a microelectronic assembly with a mounting member, classified in class 430, subclass 9.
2. The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case the different inventions are used for different purposes. The adhesive pads of Group I can be the same dimension as the semiconductor device so these devices cannot be stacked on top of another device of the same dimension the way the devices of Group II can because the adhesive pads in Group II are smaller in size than their corresponding semiconductor devices.

Inventions III or IV and II are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case the product could be used as a wafer transporting means and device without using the adhesive for bonding to another semiconductor device.

Inventions IV and III are related as mutually exclusive species in an intermediate-final product relationship. Distinctness is proven for claims in this relationship if the intermediate product is useful to make other than the final product (MPEP § 806.04(b), 3rd paragraph), and the species are patentably distinct (MPEP § 806.04(h)). In the instant case, the intermediate product is deemed to be useful as a mounting member used for dicing through the wafer and the adhesive and part way into the mounting member, but still providing support and the inventions are deemed patentably distinct since there is nothing on this record to show them to be obvious variants. Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions anticipated by the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

Art Unit: 1734

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.
4. During a telephone conversation with Edward Hotchkiss on September 17, 2003 a provisional election was made without traverse to prosecute the invention of Group II, claims 11-26. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-10, 27-49 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.
5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States

only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 11, 13-19, and 23 are rejected under 35 U.S.C. 102(e) as being anticipated by Uchida. Uchida shows the method of applying adhesive pads to microelectronic components comprising: applying an adhesive layer to the rear surface of a microelectronic wafer (column 4, lines 57-64); defining a plurality of spaced apart adhesive pads within the adhesive layer such that each of the microelectronic components has an adhesive pad attached to its back surface with the adhesive pad covering less than the entire back surface (column 5, lines 26-30; Figs. 2gB, 4aA); and singulating the microelectronic components by dicing (column 5, lines 23-26).

Regarding claim 13, Uchida further shows the microelectronic components and their associated pads separated from the remainder of the adhesive layer (column 5, lines 9-16).

Regarding claim 14, Uchida further shows positioning a mask between the adhesive layer and a radiation source (column 3, line 66 to column 4, line 4).

Regarding claims 15-19, Uchida further shows contacting the adhesive layer with a mounting member and treating the adhesive layer to yield a first adherence between the mounting member and second surfaces of the adhesive pads and a second, greater adherence between the mounting member and the remainder of the adhesive layer by positioning a mask between the adhesive layer and a radiation source and separating the components and their associated adhesive pads from a remainder of the adhesive layer by exposing the remainder of the adhesive to ultraviolet radiation (column 4, lines 33-49).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uchida in view of Jiang et al. As shown in paragraph 7 above, Uchida shows all of the claimed limitations except for the adhesive pad used to bond the microelectronic component to a second component mounted on a substrate. Uchida does show a plurality of microelectronic components stacked and bonded to each other and a substrate (Fig. 10), however the adhesive pad, 7A, in Fig. 10 is not smaller than the surface of microelectronic, 21A. The stacked components of Uchida rely on the top component being smaller than the bottom component to allow space for lead wires.

Jiang et al. teaches that a plurality of microelectronic components can be stacked and bonded to each other by using a trapezoidal shaped adhesive, 12 (Fig. 12). It would have been obvious to one of ordinary skill in the art at the time the invention was made to bond the microelectronic component of Uchida with a smaller adhesive than the surface of the microelectronic component to the surface of a second component mounted on a substrate because Jiang et al. shows that narrower adhesive surfaces than the microelectronic component it bonds allows for stacking components of the same size without interfering with lead wires.

Allowable Subject Matter

10. Claims 12, 20-22, and 24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. The following is a statement of reasons for the indication of allowable subject matter: None of the prior art suggests the claimed subject matter of defining smaller dimensioned adhesive pads by cutting, using the radiation to weaken the adherence of the adhesive pads to the mounting member, dicing the wafer while bonded to the mounting member, or cutting only part way through the adhesive layer.

Conclusion

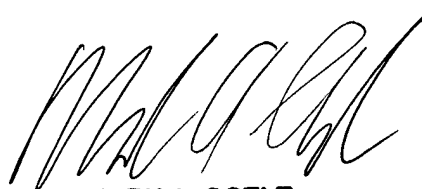
12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Sugino et al. shows dicing wafers such that adhesive pads are attached to semiconductor devices. Akram shows T-shaped spacers between stacked microelectronic devices. Noguchi et al. and Tsujimoto et al. each show shrinking of the adhesive layer beneath diced semiconductor devices to reduce the adhesive strength so the devices can be removed from the adhesive tape.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark A Osele whose telephone number is 703-308-2063. The examiner can normally be reached on Mon-Fri 9:30-6:00.

Art Unit: 1734

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on 703-308-3853. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

A handwritten signature in black ink, appearing to read 'Mark A. Osele', is positioned above the printed name and title.

MARK A. OSELE
PRIMARY EXAMINER

September 26, 2003